

Heloderma Population Survey, Rocking K Ranch

Pima County, Arizona, 1988

Report, prepared for

SWCA Environmental Consultants
P.O. Box 96
Flagstaff, Arizona 86002

By

Charles H. Love
June 1988

July 7, 1988

To: SWCA Environmental Consultants
P.O. Box 96
Flagstaff, Arizona 86002

From: C. H. Lowe *OWL*

Re: Heloderma Survey Report

Attn: Sharon Shinn Smith

Enclosed is Report on Heloderma Population Survey, Rocking K
Ranch, Pima County, Arizona, 1988, and accompanying map at
scale 1 inch = 600 feet.

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Charles H. Lowe

Introduction and Methods

The Gila Monster (Heloderma suspectum) population on Rocking K Ranch (RKR)¹ was studied in the field February-June 1988. Observations were made on other vertebrate taxa during the Heloderma survey period.

The objective was to determine population density for Heloderma suspectum on the 5830 acre Ranch. This was accomplished by direct observation of Gila Monsters foraging and in shelters, observation of sign, and, in conjunction with these, the evaluation of habitat with regard to habitat quality for Heloderma suspectum.

The yardstick for Heloderma habitat quality on RKR has been calibrated by long-term studies elsewhere in southern Arizona and the Southwest, primarily by the author. These studies have employed mark-recapture population techniques for many years; they also involve radio-telemetry for remote ground-level and underground sensing, employing animal-implanted transmitters.

1. Rocking K Ranch (K), east of Tucson and south of Saguaro National Monument East, Pima County, Arizona.

The present investigation was designed on request for an adequate short-term field study. For Heloderma, after attending the factor of correct time of investigation both seasonal and circadian, one of the most critical aspects of a short-term population study in this species is the size of the study area. The (1) relatively large size of the previously unstudied RKR (9.1 square miles), and (2) the behavior of Heloderma suspectum which spends greater than 95% of the year underground, precluded a mark-recapture methodology for estimating population size during a one-season study. Accordingly, other appropriate methods for Heloderma were employed, as above and in Results. Habitat area was measured by polar planimeter.

The live Gila Monsters encountered during the study were processed by established procedures for measuring, weighing, sexing, marking, and release. Thus, while not involved in a current long-term investigation, each was permanently marked (one toe clip) before release in the advent of future study on site.

The field work was conducted by C. H. Lowe, B. E. Martin and E. B. Wirt.

Results and Conclusions

The Gila Monster

A total of 14 live Heloderma was captured, measured, and released. Fresh sign was located for 3 others (sheds, tracks, belly-scale imprints), giving a total of 17 field observations for the species. The total of 17 observations on Heloderma was made during 48 field man days (mdf), a strongly successful Gila Monster field effort and not unexpected on the RKR, which ranch adjoins south-slope Saguaro National Monument (protected); both properties (RKR and SNM) are part of shared terrain used by the boundary area Gila Monsters that pass back and forth under the Monument south boundary fence.

The highest population density of the Gila Monster on Rocking K Ranch is on and in the vicinity of the north ranch boundary that adjoins Saguaro National Monument. This is the area indicated on the accompanying map (1 inch = 600 feet) as high quality habitat (HQHH); it lies north of the mapped HQHH limit-line--from the line to the Monument boundary fence. Medium quality habitat (HQHH) and low to no quality habitat (LQHH) on the RKR lie to the south of the mapped HQHH limit-line.

Within various conceptual approaches to the investigation and utilization of "habitat quality" with regard to a species of animal, reference here is not to the quality of a habitat in some general sense. It refers specifically to Heloderma

suspectum habitat quality (QHH): to Heloderma high quality habitat (HQHH), Heloderma medium quality habitat (MQHH), and Heloderma low to no quality habitat (LQHH), as in Tables 1 and 2. For example, HQHH refers to (1) the in-habitat occurrence of specific habitat requirements for the presence of Heloderma suspectum, (2) at or above specific levels of the specific Heloderma requirements established in earlier investigations in southern Arizona and elsewhere in the Southwest.

Regarding the acreage in each of the three-level habitat qualities for Heloderma on RKR, in the highest quality habitat area (north of the limit line) about 10-15% of the area is in islands of less than high quality habitat --about 50/50 MQHH/LQHH. In very like manner, about 10-15% of the area south of the HQHH limit line is of local areas of high quality habitat (HQHH), thereby approximately cancelling out for acreage calculations. Nearly two-thirds (62%) of the RKR terrain is high to medium quality habitat for Heloderma suspectum; the remainder varies from low to no quality habitat (Table 1). Most of the 62% is concentrated in the northern part of RKR on and in the vicinity of the HQHH area (see map), which is a ranch area of relatively high relief. All Heloderma observations were made at or above approximately 2900 ft. (834 m).

Table 2 provides population density data for Heloderma suspectum on Rocking K Ranch during the first half of

Table 1

Areal extent of relative quality of habitat for Heloderma suspectum on Rocking K Ranch during first half of calender 1988.

Heloderma Habitat Quality (QHH)	acres	mi ²	% of total
High Quality Habitat (HQHH)	2210	3.45	37.9%
Medium Quality Habitat (MQHH)	1400	2.19	24.0%
Low-No Quality Habitat (LQHH)	<u>2220</u>	<u>3.47</u>	<u>38.1%</u>
Rocking K Ranch total	5830	9.11	100.0

calendar year 1988, without reference to new hatchling recruitment in April-May. Stable March population density in highest quality habitat (HQHH) for Heloderma on RKR is estimated at 26 individuals per square mile. This is a typically high population density in excellent quality Heloderma habitat in the Arizona Upland section of the Sonoran Desert.

In Heloderma medium quality habitat (MQHH) adjacent to HQHH on the same watershed slope, bajada, or valley fill, H. suspectum populations in Sonoran desert scrub in southeastern Arizona approximate 30% of the density in adjacent HQHH. Thirty percent provides a conservative estimate for MQHH on RKR (Table 2).

Heloderma low quality habitat (LQHH) supports an average 25% of the population density in adjacent MQHH. Much of the low quality habitat for Heloderma is in areas of the highly disclimax semidesert grassland environments on RKR (Table 2).

Summing densities in Table 2 yields a total population density of 114 Gila Monsters on Rocking K Ranch during the first quarter of calendar year 1988. $N = 114$ is the standing crop density of Heloderma suspectum on the study area as of March 30, 1988.

Other Taxa

During the Heloderma survey other taxa were encountered on RKR. Among them were the following conspicuous or otherwise notable reptiles and large mammals:

Reptiles

Desert Tortoise

Plains Skink

Regal Horned Lizard

Western Diamondback Rattlesnake

Tiger Rattlesnake

Blacktailed Rattlesnake

Mohave Rattlesnake

Bullsnake

Whipsnake

Mammals

Coati

Javelina

Mule Deer

Five of the above were observed crossing under the RKR-Saguaro National Monument common boundary fence (Dept. Interior fence): Gila Monster

Desert Tortoise

Whipsnake

Javelina

Further details were recorded for the taxa above and for other taxa.

Overview

In closing I should emphasize some findings concerning two things--the density of the Gila Monster population on Rocking K Ranch, and the desert environment in which the Gila Monsters live.

There is 1.0 Gila Monster for every 24.6 (25) acres of high quality Heloderma habitat on Rocking K Ranch, of which there are 2,210 acres. Thus the Gila Monster population on RKR is one of the largest (densest) and healthiest in southern Arizona.

The study area environment in which this dense Gila Monster population lives is shared by both Rocking K Ranch and Saguaro National Monument. The Saguaro National Monument (East) south boundary fence straddles both the Saguaro population and the Gila Monster population that occurs along the northern periphery of Rocking K Ranch. In the Monument south-boundary area of both Ranch and Monument, the Gila Monster population is situated in what is the finest stand of vigorously reproducing saguaros in the entire area of the East of Tucson division of the Monument; it is also one of the finest saguaro stands in all of Saguaro National Monument, both East and West.